



by Stephan Blankaart in 1688, the first observation of the metamorphosis of a free-living copepod by Johan Christian Lange in 1756, the first species (*Monoculus quadricornis*) to be named by Linnaeus in 1758, the first description of a free-living marine copepod (*Calanus finmarchicus*) by Johan Ernst Gunnerus in 1770, and the first observation of a parasitic copepod's metamorphosis by Jacques Simon Amand Suriray in 1819. The epilogue portrays the transition to the mid-nineteenth century and previews numerous personal connections that culminated during the "Golden Age of Copepodology" in the 1890s. This era, dominated by key-players such as Carl Claus, George Stewardson Brady, Eugène Canu, Wilhelm Giesbrecht and Georg Ossian Sars, will form the subject of the second volume. A third volume will take the history of copepodology to c. 1950.

Although the author himself points out that "no single book could encompass the whole biographical and bibliographical history of the study of copepods", *The copepodologist's cabinet* is unquestionably the most thorough and scholarly history of early contributions to copepodology. The book is a riveting read, elegantly produced, and abounds with fascinating stories and snippets. The numerous facsimiles of title pages and frontispieces, the invaluable historic illustrations of copepods and the portraits of authorities who examined them are all beautifully reproduced on high quality paper. The comprehensive bibliography is interspersed with signatures of eminent and less renowned copepod workers. In conclusion, this book will no doubt be treasured by anyone who is interested in the history of carcinological research in general and copepodology in particular.

RONY HUYS

FAUST, I. *Zoologische Einblattdrucke und Flugschriften vor 1800. Band V: Unpaarhufer, Nashörner, Tapire, Pferdeartige, Sammelblätter, Monster. Generalregister zu Band I–V*. Anton Hiersemann Verlag, Stuttgart: 2003. Pp vii, 383; illustrated (1 colour plate, 216 monochrome). Price € 360. ISBN 3-7772-0328-9 (hardback).

The sources available to document and interpret the history of zoology are immensely diverse (amply demonstrated by the pages of *Archives of natural history*), ranging from books, journals and newspapers to manuscripts and works of art. Although requiring perseverance and serendipity, most of these are retrievable through catalogues and references in the literature. When it comes to sales catalogues, guide books or pamphlets, we struggle to find them because few copies were preserved and they are often anonymous; indeed, we are generally unaware of their existence. More elusive still are broadsheets (handbills and posters) with which the present book is concerned. In my experience of zoological museums and libraries around the world, broadsheets, if they are kept at all, can seldom be found in the institution's main catalogue, and hence tend to be overlooked as a source of information about a particular animal or menagerie. Hopefully computerization of catalogues will help in retrieving these ephemeral publications in the future.

In the meantime, we can turn to this multi-volume book by Ingrid Faust, which is a catalogue of her private collection of illustrated zoological broadsheets and pamphlets published before 1800, supplemented by similar material from elsewhere. The first two volumes in the series were reviewed by Herman Reichenbach (*Archives of natural history* 27: 276-278 (2000)). We now have the fifth and probably final volume (although a supplement may be added), which is structured very much like the previous ones. There is a preface, followed by a catalogue organized according to taxonomic group, then an index (the main bibliography is found in volume 1). Every item is illustrated on the right-hand page and annotated on the facing left-hand page, with details of title, date, size, contents, publisher, and known examples.

Broadsheets are important in zoological history to reconstruct the history of individual animals shown in Europe outside the established royal menageries, and to understand the popular knowledge about specific animals. The current volume covers the rhinoceros, tapir and 'monsters'. Certainly, as far as the history of the rhinoceros is concerned, research will never be the same due to the appearance of this work. The book illustrates about a hundred different broadsheets (in 170 pages) depicting the rhinoceroses which were seen alive in Europe between 1515 and 1800. It is established that the woodcut

by Albrecht Dürer made of an animal in Lisbon in 1515 exists in only four states with German text, rather than five as hitherto assumed. A very large section is devoted to the travels and related material of Clara, the Dutch Rhinoceros, which travelled through most European countries from 1742 to 1758. One or two additions were made to her itinerary, which is hardly surprising as there are still quite large gaps in our knowledge. The most important discovery was an original drawing by Anton August Beck of Braunschweig (p. 66), which was the model for the image of the rhinoceros on all broadsheets issued during the tour through Europe. This illustration was seen by many in mid-eighteenth century Europe and must have been influential in challenging the ubiquitous rhinoceros of Dürer with the little hornlet on the shoulders. With all known broadsheets and pamphlets of these rhinoceroses documented and illustrated, Faust has provided us with a powerful tool, which will allow future discoveries to be made and to be put in their correct historical context.

These are grand volumes, which should be consulted by all those interested in the popular view of animals up to the eighteenth century, and which would be an asset to any bookshelf.

KEES ROOKMAAKER

ROSA, D. *Ologenesi*. (Introduced and edited by A. La Vergata.) Biblioteca della Scienza Italiana, Firenze: 2001. Pp 446. Price € 40. ISBN 88-09-02334-X (paperback).

There is no mention of the Italian marine zoologist Daniele Rosa (1857–1944) and his theory of hologenesis in Pagel (2002) nor in Gould's *The structure of evolutionary theory* (2002). Indeed, there is no doubt that Rosa's theory, first suggested in 1899 but not presented in full until 1918, has failed to establish itself as a component of current evolutionary thought. In an article on hologenesis in Tort's *Dictionnaire du Darwinisme et de l'évolution*, La Vergata (1996), editor of this recently published edition of Rosa's *Ologenesi*, identified only three scientists whose opinions were clearly influenced by Rosa's views on evolution. Two of them were anthropologists, one Italian and one French; the third was the Italian zoologist Giuseppe Colosi, one of Rosa's pupils.

That most of Rosa's works were written in Italian may not be the main reason for the general oblivion into which his ideas rapidly fell, and a possible linguistic barrier was relieved by Rosa himself by publishing in 1931 a French edition of his book. Much more important was his taking sides with the defenders of evolution by internal causes, an obviously weak position in the years of Neodarwinism. Many authors have simply ranked Rosa's hologenesis with those theories of evolution by internal causes that have, since the last two decades of the nineteenth century, found so many advocates among zoologists, botanists and palaeontologists. Rosa took care, however, to explain what he regarded as fundamentally new in his theory; like Naegeli he advocated internal causes as the basic explanation of evolution, but also saw all branching (speciation) events as strictly binary (dichotomous) and predetermined as to their outcome. In this context predetermination means that at a given stage of the evolutionary process all members of a given species will give rise, more or less synchronously, to the same pair of daughter species. It is this aspect that explains the term hologenesis adopted by Rosa for his theory.

These views led him to several interesting (or curious) ramifications. One of these was his concept of bathysymphyly, the hypothesis that the branching event from which two evolutionary lineages originated, such as molluscs and arthropods, was very likely much earlier in time than the actual origin of the body plans of the main animal phyla and perhaps so early in phylogenetic history as to have occurred when arthropod and mollusc ancestors were still unicellular. Other theoretical ramifications of the theory are important for biogeography. According to Rosa, descendants are more complex and specialized than their ancestors, hence their geographical ranges are increasingly small and generally non-overlapping, a pattern that modern biogeographers would call a vicariance pattern.

Dichotomous patterns like those of cladograms and a biogeography of vicariantist flavour could not fail to attract the attention of the theorists of biological systematics, as soon as Hennigian cladistics gained a foothold. Thus it is in the cladistic literature of the late 1970s and early 1980s that we find the largest number of references to Rosa's hologenesis, with some regarding him as a direct precursor of some of